3.12 CULTURAL AND PALEONTOLOGICAL RESOURCES

Cultural resources include prehistoric archaeological sites, historic archaeological sites, traditional cultural properties, and historic structures. *Paleontological resources* are resources in the fossil record, such as prehistoric remains and other evidence of past life. This section discusses the applicable federal and state laws and regulations that protect cultural and paleontological resources, including Section 106 of the National Historic Preservation Act (NHPA) and California Public Resources Code Sections 5024.1 and 21084.1, and assesses the potential for the proposed high-speed train (HST) system and alternatives to have impacts on these resources.

3.12.1 Regulatory Requirements and Methods of Evaluation

A. REGULATORY REQUIREMENTS

Cultural Resources

The NHPA (16 U.S.C. § 470 *et seq.*) established a national program to preserve the country's historical and cultural resources. Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties and provide the President's Advisory Council on Historic Preservation an opportunity to comment on a proposed action before it is implemented. Guidelines for implementing the Section 106 process are provided in 36 C.F.R. Part 800. Under both state and federal guidelines for cultural resources, impacts are considered potentially significant if the resource being impacted has been determined historically significant or potentially significant. Under state law, projects that would cause a substantial adverse change in the historical significance of a historical resource are considered projects that may have a significant effect on the environment for CEQA purposes.

Under federal regulations implementing NHPA Section 106 (36 C.F.R. § 800.4), significant cultural resources are those that are eligible for listing in the National Register of Historic Places (NRHP). The NRHP eligibility criteria (36 C.F.R. § 60.4) state that the quality of *significance* in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that meet the following criteria.

- The resource is associated with events that have made a significant contribution to the broad patterns of our history.
- The resource is associated with the lives of persons significant in our past.
- The resource embodies the distinctive characteristics of a type, period, or method of construction; represents the work of a master; possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction.
- The resource has yielded, or may be likely to yield, information important to prehistory or history.
- The resource is more than 50 years old, unless it is exceptionally important.

Under CEQA, significant cultural resources are called historical resources whether they are of historic or prehistoric age. *Historical resources* are resources that are listed or eligible for listing in the California Register of Historical Resources (CRHR) or that are listed in the historical register of a local jurisdiction (county or city). Sites in California that are listed in the NRHP are also listed in the CRHR (P.R.C. § 5024.1). Generally, a resource should be considered by a lead agency to be historically significant if the resource has integrity and meets one of the following criteria for CRHR listing (CEQA Guidelines § 15064.5[a][3]).

- The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage and/or with the lives of persons important in California's past.
- The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
- The resource has yielded, or may be likely to yield, information important in prehistory or history.

The NRHP and CRHR criteria are almost identical. Any resource determined eligible for NRHP is also automatically eligible for CRHR. However, the treatment of historical resources under CEQA and CRHR is more inclusive in that resources listed in local historical registers may be included.

Impacts on NRHP-eligible resources are *adverse* when "an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association" (36 C.F.R. § 800.5[1]). Examples of adverse effects include physical destruction or damage to all or part of the property; alteration that is not consistent with the Secretary of the Interior's standards for the treatment of historic properties; removal of the property from its historic location; change in the type of use or of the physical characteristics of the setting; introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features; and neglect resulting in deterioration (36 C.F.R. § 800.5[2]). Historic properties include prehistoric archaeological sites. Archaeological sites are usually adversely affected only by physical destruction or damage, whereas all of the examples above can apply to historic buildings and structures.

Impacts on CRHR-listed and -eligible resources and resources listed in local historical registers constitute a significant effect on the environment (significant impacts that must be disclosed in a CEQA environmental document) if the project may cause a substantial adverse change in the significance of a historical resource (P.R.C. § 21084.1). *Substantial adverse change in the significance of a historical resource* refers to "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that [its] significance … would be materially impaired" (CEQA Guidelines § 15064.5[b][1]). *Material impairment* means demolition of the resource, or alteration of the physical characteristics that make the resource eligible for listing such that it would no longer be eligible for the CRHR or a local historical register (CEQA Guidelines § 15064.5[b][2]).

Paleontological Resources

The following United States statutes incorporate provisions for the protection of paleontological resources.

- Federal Antiquities Act of 1906 (16 U.S.C. § 431 *et seq.*): Establishes national monuments and reservation of lands that have historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federal lands. Section 433 prohibits appropriation, excavation, injury, or destruction of any historic or prehistoric ruin or monument, or any object of antiquity on federal land.
- National Environmental Policy Act of 1969 (P.L. 91–190, 83 Stat. 852, 42 U.S.C. §§ 4321–4327): Mandates policies to "preserve important historic, cultural, and natural aspects of our national heritage" (§ 101.b4).

In California, fossil resources are considered a limited, nonrenewable, highly sensitive scientific resource. The following state statutes incorporate provisions for the protection of paleontological resources.

- CEQA (P.R.C. § 21000 *et seq.*): Requires public agencies and private interests to identify the potential adverse impacts and/or environmental consequences of their proposed project(s) to any object or site that is historically or archaeologically significant or significant in the cultural or scientific annals of California (P.R.C. § 5020.1). Under CEQA, archaeological resources are presumed nonunique unless they meet the definition of "unique archaeological resources" (P.R.C. § 21083.2[g]). Under CEQA, an impact on a nonunique archaeological resource is not considered a significant environmental impact. An EIR need not discuss nonunique archaeological resources.
- CEQA Guidelines (14 C.C.R. § 15064.5 [a][3]): Provides that a lead agency may find that "any object, building, structure, site, area, place, record, or manuscript" is historically significant or significant in the "cultural annals of California." The section also provides that, generally, a resource may be considered historically significant if it has yielded or may be likely to yield information important in prehistory. Paleontological resources fall within this broad category and are included in the CEQA checklist under *Cultural Resources*.
- Public Resources Code Section 5097.5: Prohibits excavation or removal of any "vertebrate paleontological site ... or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands." *Public lands* include lands owned by or under the jurisdiction of the State of California or any city, county, district, authority, or public corporation, or any agency thereof. This section provides that any unauthorized disturbance or removal of paleontologic, archaeologic, and/or historic materials or sites located on public lands, which violates the section, is a misdemeanor.
- Public Resources Code Section 30244: Requires reasonable mitigation of adverse impacts on paleontological resources resulting from development on public land in the Coastal Zone, as defined in Public Resources Code Section 30103.

B. METHOD OF EVALUATION OF IMPACTS

Archaeological Sites and Traditional Cultural Properties

The FRA and Authority initiated consultation with the State Historic Preservation Office (SHPO) under Section 106 of the NHPA in November 2002 with a letter (Appendix 3.12-A) that proposed a phased identification effort for historic properties as provided for in 36 C.F.R. § 800.4 (b)(2), and requested the SHPO to designate an appropriate area of potential effect (APE) for the records search and analysis for this Program EIR/EIS. The SHPO was also consulted about the method of evaluation for this Program EIR/EIS. The FRA and the Authority also initiated consultation with the Native American Heritage Commission for a search of their Sacred Lands file and lists of Native American contacts, as required by 36 C.F.R. § 800.4(a)(4). The contacts were sent letters providing information about the proposed project alternatives and requesting information about any traditional cultural properties that could be affected by the project (36 C.F.R. § 800.4[a][4]).

Authority staff also met with tribal representatives in a series of three Native American Outreach Workshops during the fall of 2003. The workshops were held on September 9, 2003, at Frazier Park in the Tehachapi Mountains; on September 10, 2003, at the San Luis Recreation Area in Gustine; and on October 9, 2003, at the Temecula Community Center. HST alignment options and potential station locations, potential impacts on cultural resources, the level of detail of the Program EIR/EIS studies, and need for potential subsequent project-specific studies were

discussed at each of the workshops. At the Frazier Park workshop, concerns were raised about potential impacts on sensitive cultural resources along the HST alignment options through the I-5 corridor between Bakersfield and Los Angeles, in particular for the northern portion of the Tehachapi range area between Grapevine and Frazier Park. At the San Luis Recreation Area workshop, concerns were raised about potential impacts on sensitive cultural resources along the HST Pacheco Pass alignment options, both through the mountains and in the Santa Clara Valley between Gilroy and Morgan Hill. During this meeting it was also noted by those attending that the Altamont Pass corridor, which was eliminated from further consideration for the HST system, would have considerably more potential impacts on Native American traditional cultural properties than either the Diablo Range direct or Pacheco Pass corridors that are being considered for further HST evaluation. At the Temecula workshop, concerns were raised about potential impacts on sensitive cultural resources along the HST alignment options through the Soledad Canyon between the Antelope Valley and Los Angeles, and in regards to potential alignment and tunneling impacts through the mountain range just south of Temecula along the I-215/I-15 HST alignment.

In addition, information from records searches was obtained from the appropriate California Historical Resources Information System (CHRIS) Information Centers. The records searches identified the general locations of archaeological sites in the APE. The number of archaeological sites within the APE for each alternative was tabulated and used as an indicator of potential sensitivity for the comparison of the relative degree of potential impacts or effects for each alternative. For this program-level analysis, individual archaeological sites were not evaluated for eligibility. Instead, the archaeological sites identified as a result of the records searches were considered potentially eligible for listing in the CRHR or the NRHP, and the number of archaeological sites per linear mile identified in the APE for each alternative was used as one indicator of the relative degree of potential impacts on cultural resources from construction or operation of that alternative. Impacts on NRHP-eligible archaeological resources include physical destruction or damage. The total number of archaeological sites in the APE for the corridor was divided by the total length of the corridor being evaluated to arrive at an average number of sites (or proportion of sites) per mile. That average was then translated to a qualitative rating of *low*, *medium*, and *high* impacts as follows.

- Low: 0.00–0.25 site per mile for the corridor.
- Medium: 0.26–0.75 site per mile.
- High: 0.76–more than one site per mile.

The cultural resource specialist's knowledge and background of regional prehistory supplemented the records search results. For example, if the cultural resource specialist has previous experience that several sites have been identified along a particular river drainage in the region, but the records search did not yield formally recorded sites in CHRIS within the APE for a particular alternative route, the cultural resource specialist documented the additional information and, based on it, increased the rating for that corridor.

Traditional cultural properties were assessed on a presence/absence basis using record searches of CHRIS repositories for each alternative route. If a traditional cultural property (for example, habitation sites, shell mounds, burial sites) is present along the route for an alternative, that route was automatically ranked high for archaeological resources, indicating that the potential sensitivity to impacts from construction disturbance would be greater in that corridor than in a corridor ranked as low or medium.

Historic Structures

Structures from the historic period consist of houses, outbuildings, stores, offices, factories, barns, corrals, mines, dams, bridges, roads, and other facilities that served residential, commercial, industrial, agricultural, transportation, and other functions during the historic period (more than 50 years ago). Specific structures from the historic period were not identified for this program-level analysis. Instead, the percentage, based on linear miles, of each alternative corridor that passed through areas that originally developed in specific, predefined historical time periods (before 1900, 1900 to 1929, and 1930 to 1958) was determined from historical maps, aerial photographs, and local planning documents of the history of the region. The percentages were used as indicators of the potential for a particular alternative to impact potentially eligible structures from the historical time periods. Percentages of route lengths that developed in various periods, along with known National Register Historic Districts and listed eligible properties, were then used to derive qualitative rankings of *low*, *medium*, and *high* as follows.

- Low: 0%–25% of the corridor passes by properties 50 years old or older.
- Medium: 26%–75% of the corridor passes by properties 50 years old or older.
- High: 76%–100% of the corridor passes by properties 50 years old or older.

Paleontological Resources

Paleontological resources determined to be significant are fossils or assemblages of fossils that are unique, unusual, rare, uncommon, and diagnostically or stratigraphically (layers of the earth's surface) important, and/or those that add to an existing body of knowledge in specific areas—stratigraphically, taxonomically, and/or regionally.

Literature research and institutional records searches or geologic maps and geographic data from the University of California Museum of Paleontology in Berkeley have resulted in the designation of areas within the APE as having *high*, *low*, or *undetermined* paleontologic sensitivity, as follows.

- High: Sedimentary units with a high potential for containing significant nonrenewable paleontological resources. In these cases the sedimentary rock unit contains a high density of recorded vertebrate fossil sites, has produced vertebrate fossil remains within the study area and/or vicinity, and is likely to yield additional remains within the study area.
- Low: The rock unit contains no or very low density of recorded resource localities, has produced little or no fossil remains within the study area and/or vicinity, and is not likely to yield any remains within the study area.
- Undetermined: The rock unit has had limited exposure(s) in the study area and has been little studied, and there are no known recorded paleontological resource localities. However, in other areas, the same or a similar rock unit contains sufficient paleontological resource localities to suggest that exposures to disturbance of the unit within the right-of-way have potential to yield fossil remains.

The number of rock units (formations) having high paleontologic sensitivity and the number of paleontological resource localities recorded within each study area were assessed to provide an accurate interpretation of the overall ranking of high, low, or undetermined potential to impact significant nonrenewable paleontological resources. This evaluation was reached using both the numbers of formations and localities and incorporating professional assessments regarding the significance of recovered resources from exposed rock units and the likelihood of these rock units to contain additional paleontological resources.

3.12.2 Affected Environment

A. STUDY AREA DEFINED: AREA OF POTENTIAL EFFECT

The study area for cultural resources is the APE that was defined in consultation with the SHPO. At this program level of analysis, information for the APE about the locations of archaeological sites was obtained from the Information Centers of CHRIS, administered by the California Department of Parks and Recreation. The CHRIS database includes all resources listed in CRHR; all resources in California listed in or eligible for listing in NRHP; and traditional cultural properties, including some Native American traditional cultural sites, identified through consultation with the California Department of Parks and Recreation (Section 106 of NHPA), SHPO (P.R.C. § 5042 *et seq.*) or the Native American Heritage Commission.

Based on consultation with the SHPO, the APE for cultural resources for the proposed HST Alternative is as follows.

- 500 ft (152 m) on each side of the centerline of proposed new rail routes where additional right-of-way could be needed.
- 100 ft (30 m) on each side of the centerline for routes along existing highways and railroads where very little additional right-of-way would be needed.
- 100 ft (30 m) feet around station locations.

Under the Modal Alternative, the APE for freeway routes and around airports is 100 ft (30 m) beyond the existing freeway right-of-way and 100 ft (30 m) beyond the existing airport property boundary.

The study area for paleontological resources under the HSR Alternative is 100 ft (30 m) on each side of the centerline of proposed rail routes (including station locations), in both nonurban and urban areas. The paleontological APE under the Modal Alternative for freeway routes and around airports is 100 ft (30 m) beyond the existing freeway right-of-way and 100 ft (30 m) beyond the existing airport property boundary. The study area for paleontological resources is limited to the area that would potentially be disturbed by earthwork construction activities.

B. CULTURAL RESOURCE CATEGORIES

The following topics are covered in this section.

- Prehistoric archaeological sites.
- Historic archaeological sites.
- Traditional cultural properties.
- Historic structures.
- Paleontological resources.

Following are brief descriptions of each type of resource.

Prehistoric Archaeological Sites

Prehistoric archaeological sites in California are places where Native Americans lived or carried out activities during the prehistoric period before 1769 AD. Prehistoric sites contain artifacts and subsistence remains, and they may contain human burials. Artifacts are objects made by people and include tools (projectile points, scrapers, and grinding implements, for example), waste products from making flaked stone tools (debitage), and nonutilitarian artifacts (beads, ornaments, ceremonial items, and rock art). Subsistence remains include the inedible portions of

foods, such as animal bone and shell, and edible parts that were lost and not consumed, such as charred seeds.

Historic Archaeological Sites

Historic archaeological sites in California are places where human activities were carried out during the historic period between 1769 AD and 50 years ago. Some of these sites may be the result of Native American activities during the historic period, but most are the result of Spanish, Mexican, or Anglo-American activities. Most historic archaeological sites are places where houses formerly existed and contain ceramic, metal, and glass refuse resulting from the transport, preparation, and consumption of food. Such sites can also contain house foundations and structural remnants, such as windowpane glass, lumber, and nails. Historical archaeological sites can also be nonresidential, resulting from ranching, farming, industrial, and other activities.

Traditional Cultural Properties

Traditional cultural properties are places associated with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Examples include locations "associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world" and locations "where Native American religious practitioners have historically gone, and are known or thought to go today, to perform ceremonial activities in accordance with traditional cultural rules of practice" (Parker and King 1990). Traditional cultural properties are identified by consulting with Native American groups that have a history of using an area, as well as the Native American Heritage Commission, the Sacred Lands File, and tribal representatives.

Historic Structures

Historic structures consist of houses, outbuildings, stores, offices, factories, barns, corrals, mines, dams, bridges, roads, and other facilities that served residential, commercial, industrial, agricultural, transportation, and other functions during historic periods (more than 50 years ago). The historic periods correspond to the principal architectural styles seen in California: before 1900 (pre-Victorian and Victorian), 1900 to 1929 (Craftsman/bungalow), and 1930 to 1958 (commercial moderne and residential ranch style).

Paleontological Resources

Paleontological resources are the fossilized remains of animals and plants. They are typically found in sedimentary rock units, and they provide information about the evolution of life on earth over the past 500 million years or more.

C. CULTURAL RESOURCES BY REGION

CHRIS information centers were a primary source of data for the identification of historic properties and archaeological resources in the cultural resources study area.

Archaeological Resources by Region

As described above, information on the numbers, kinds, and locations of archaeological sites for this Program EIR/EIS was obtained from CHRIS. For the most part, the data from CHRIS provide archaeological site information only for areas that have been previously surveyed by archaeologists. No archaeological field surveys were conducted for this Program EIR/EIS. However, surveys would be a part of the next stage of environmental review in the project-level EIR/EIS (see Section 3.12-6).

Bay Area to Merced: This region includes central California from the San Francisco Bay Area (San Francisco and Oakland) south to the Santa Clara Valley and east across the Diablo Range to the

Central Valley. Archaeological evidence places prehistoric people in California as early as 8,000 to 12,000 years ago; however, in the Bay Area to Merced region, the last 2,000 to 4,000 years are best documented. The regional chronological sequence of time periods (PaleoIndian; Early, Middle, and Late Archaic; and Protohistoric) reflects changes in land use that were influenced by population growth (e.g., shift from small camps to village sites), technological innovation (e.g., shift from use of the spear to bow and arrow), and resource intensification (e.g., the intensive use of mortars and pestles and bedrock milling features for acorn processing). Change also resulted from population movements and displacements, and from outside influences such as climate change and rise in sea level.

The records search for the project APE in the Bay Area to Merced region identified 109 archaeological sites: 95 prehistoric sites, 13 historic sites, and one site with both prehistoric and historic archaeological components. Half of the prehistoric sites are habitation sites, variously referred to as shell mounds, shell middens, and large flaked and ground stone scatters[1] with midden[2] accumulations, but also including sites where house pits were noted. Many of these habitation sites (the shell mounds around San Francisco Bay in particular) contain Native American burials. Burials are noted on the site records for more than 15% of the sites within the APE. Other types of sites identified in the APE include bedrock mortars, lithic scatters,[3] ground stone scatters, and fire-affected rock scatters.[4] The 13 historic archaeological sites identified within the APE include debris and features associated with 19th- and early 20th-century housing developments, farm complexes, and post–World War II trash dumps. The third location of Mission Santa Clara de Asís, near the Santa Clara train station, is the site identified above where both prehistoric and historic components are present.

Sacramento to Bakersfield: This region of central California includes a large portion of the Central Valley (San Joaquin Valley) from Sacramento south to Bakersfield. Archaeological investigations conducted in the southern San Joaquin Valley generally document human occupation of the region since about 12,000 years ago. Population density was low at that time, with the few settlements concentrated around the shores of ancient water sources such as Tulare and Buena Vista Lakes. Because of the rapid accumulation of sediment on the valley floor, older archaeological material tends to be deeply buried. Material from a site near Buena Vista Lake is estimated to be 7,500 to 11,500 years old. Most other archaeological material found in the southern valley appears to be a result of the presence of the Yokuts in the San Joaquin Valley throughout the last 2,000 years.

The Sacramento to Bakersfield portion of the project APE passes through the traditional lands of four Native American groups: the Nissenan, Plains Miwok, Northern Valley Yokuts, and Southern Valley Yokuts. However, the northern San Joaquin Valley is one large area in California for which very little ethnographic information is available. The dearth of information about the early inhabitants of the region is thought to be due in part to their rapid depopulation as a result of European diseases in the early 19th century and invasion of their territory by gold miners and others in the mid-19th century. Most of what is known about the early inhabitants comes from the writings of explorers and other early travelers in the region. By piecing together these scraps

[1] *Ground stone scatter* refers to a site containing milling equipment, including handstones, mortars, and pestles.

[2] *Midden* refers to a mound or deposit containing shells, animal bones, and other refuse that indicates the site of a human settlement.

[3] *Lithic scatter* refers to a site containing general utility implements such as projectile points, bifaces, expedient flake tools, and debitage.

[4] *Rock scatter* refers to dispersed pieces of rock.

of information, it has been determined that by the time of the first European visitors, the primary inhabitants of the area were the Northern Valley Yokuts.

Prehistoric archaeological sites in the region consist of habitation sites, many of which represent village locations, and lithic scatters, which may represent camps and activity areas away from villages. Cemeteries and isolated burials are also present. Most prehistoric sites in this region are found between Sacramento and Stockton, where many rivers and streams that originate in the Sierras to the east cross the Modal Alternative and the HST Alternative routes, and between Tulare and Bakersfield near Tulare and Buena Vista Lakes. (See Section 3.14, *Hydrology and Water Resources*, for maps of rivers and streams). Proximity to water was common for habitation sites because the rivers and streams were a source of food and water.

San Joaquin Valley archaeological sites containing material from the historic period include sites with structural remains (usually foundations) and associated refuse, and sites consisting only of refuse.

Bakersfield to Los Angeles: This region of southern California encompasses the southern portion of the Central Valley south of Bakersfield, the mountainous areas between the Central Valley and the Los Angeles basin, and the northern portion of the Los Angeles basin from Sylmar to downtown Los Angeles. The prehistory of the Mojave Desert has been divided into several periods spanning the time from 10,000 BC (approximately 12,000 years ago) to the time of Euro-American contact in the early 19th century. Each period has characteristic artifacts and subsistence systems. The earliest occupation of the Mojave Desert for which widely accepted data are available began about 10,000 BC, or 12,000 years ago. The period from 10,000 BC to 5,000 BC (12,000 years ago to 7,000 years ago) is known as the Lake Mojave Period. This period was followed by the Pinto Period (5000 to 2000 BC, or 7,000 to 4,000 years ago); the Gypsum Period (2000 BC to 500 AD, or 4,000 years ago to 1,500 years ago); the Saratoga Springs Period (500 AD to 1200); and the Shoshonean Period (began 1200 AD).

The Milling Stone Period along the southern California coast (about 5000 BC to 1000 BC, or from 7,000 to 3,000 years ago) was characterized by smaller, more mobile groups compared to later periods. The period from 1000 BC to 750 AD (3,000 years ago to 1,350 years ago) is known archaeologically as the Intermediate Period. More specifically, in the Los Angeles basin, perhaps the earliest evidence of human occupation was recovered from the tar pits of Rancho La Brea. In 1914, the partial skeleton of a young woman was discovered in association with a stone used for grinding by hand, called a *mano*. In the 1970s, a collagen sample from the skeleton was dated at circa 9,000 years old. In addition, projectile points similar to those found in the desert dating from 7,000 to 10,000 years ago, as well as crescent-shaped flaked tools, called *crescentics*, have been recovered from bluffs near Ballona Lagoon. The presence of these point types along the coast suggests connections between what is now the Los Angeles area and the cultures of the southeastern California desert regions present during this early period.

The Los Angeles basin was part of territory occupied by the Tongva Native American groups (renamed Gabrieliños by early explorers, missionaries, and settlers) when the Spanish arrived in 1769 AD. Tongva settlement and subsistence systems may extend back in time to the beginning of the Late Prehistoric Period, about 750 AD.

Prehistoric archaeological sites types commonly found along the APE for the HST and Modal Alternative alignments in the Bakersfield to Los Angeles region include lithic scatters, milling stations, and quarries. Less common are habitation sites, which can include midden, rock features and, in some cases, human burials. One rock art site, a petroglyph, is also known to exist within the APE.

Los Angeles to San Diego via Inland Empire: This region of southern California includes the eastern portion of the Los Angeles basin from downtown Los Angeles east to the Riverside and San Bernardino areas and south to San Diego generally along the I-215 and I-15 corridors. This region includes a portion of the Los Angeles basin. The prehistory and ethnography of this area were discussed above in the *Bakersfield to Los Angeles* section. The rest of the region consists of the area east of the Santa Ana Mountains in Riverside County and east of the coastal hills in San Diego County.

The 241 known archeological sites in the region reflect the full range of cultures and periods, from chronologically ancient prehistoric Native American, to historic European (Spanish/Mexican) settlements, to historic Euro-American settlements and more recent periods through World War II urban and industrial growth. There are 130 prehistoric sites and 101 sites from the historic period. The majority of the prehistoric sites (80) are in San Diego County, and 48 of the 101 historic sites are in San Bernardino County.

The San Dieguito Complex[5] was originally thought to represent big-game hunters who moved to the San Diego County coastal area from the Great Basin during Early Holocene time (8,000 to 10,000 years before present [BP], or 10,000–5,000 BC). This movement occurred when warmer, drier conditions resulted in desiccation of the pluvial lakes in the Great Basin. Although it was thought that big-game hunting continued after these people arrived on the coast during Early Holocene time, more recent investigations at Early Holocene sites closer to the coast have shown that a wide range of plant foods, along with small and medium terrestrial mammals, fish, and shellfish, were also being exploited in these sites. Population size was likely low, with relatively little competition for resources. Therefore, small groups probably migrated throughout the coastal area and the area inland of the coastal hills and mountains to wherever the best resources were available at the time.

The Pauma Complex characterized inland San Diego County and southwestern Riverside County during the period from 3,000 to 8,000 years ago. However, there are few sites that date to the period from 1,300 to 3,000 BP in northern San Diego County and western Riverside County.

A larger population, a more sedentary settlement system, and a more intensive use of available resources characterize the Late Period (100 to 1,300 BP in this area). The large villages, occupied almost year-round, that were present when the Spanish explored this area in 1769 AD developed during this period.

Los Angeles to San Diego via Orange County: This region includes the western portion of the Los Angeles basin between downtown Los Angeles and Los Angeles International Airport (LAX) and the coastal areas of southern California between Los Angeles and San Diego, generally following the existing Los Angeles to San Diego via Orange County (LOSSAN) rail corridor. The prehistory and ethnography of the Los Angeles basin portion of the region was discussed above in the *Bakersfield to Los Angeles* section.

The prehistory of coastal San Diego County begins with the San Dieguito Complex, as discussed above in the *Los Angeles to San Diego via Inland Empire* section. Archaeological sites occupied between 3,000 and 8,000 years ago on the San Diego County coast belong to the La Jolla Complex. Most La Jolla Complex sites are located around the coastal lagoons, which began filling with seawater at the beginning of this period because of a rise in the sea level, as the ice caps melted at the end of the last ice age. Most sites around lagoons on the San Diego County coast

[5] *Complex* refers to a group or association of artifacts and subsistence remains that are characteristic of a specific period of time and geographic area.

were abandoned about 3,000 years ago. However, sites around Peñasquitos Lagoon and San Diego Bay continued to be occupied because these two southern bay/estuary systems did not fill with sediment. Still, in general, there are few sites in the coastal region that date to the period between 1,300 and 3,000 BP. Little is known about settlement and subsistence during this period of San Diego County prehistory.

The Late Period (200 to 1,300 BP in this area) is characterized by a more sedentary settlement system and a more intensive use of available resources. The large villages, occupied almost year-round, that were observed by the Spanish in 1769 AD developed during this period.

Historic Structures by Region

Historic maps and aerial photographs and local planning documents used in the analysis indicate that most surviving architecture constructed before 1900 is Victorian in style and dates from the 1880s and 1890s. Surviving structures built prior to 1880 consist of a few remaining wood-frame structures from the period 1849 to 1880, and a few remaining adobe structures dating to the Mexican period prior to 1848.

Originally California was a Spanish colony. Spanish settlement began in 1769 with the Portola Expedition. As a result of this expedition, 21 missions and several presidios (forts) and towns were established near the coast between San Diego and Sonoma. Two of the missions, San Gabriel and San Juan Capistrano, are located near proposed project alignments. The San Gabriel Mission is located along the proposed HST Alternative alignment in the Los Angeles to San Diego via Inland Empire region. The San Juan Capistrano Mission is located near all of the proposed HST and Modal Alternative routes through San Juan Capistrano in the LOSSAN region. (See Chapter 2, *Alternatives*, for maps of the routes).

During their occupation of the area, the Spanish made a few land grants to retired soldiers. In addition, after Mexico became independent from Spain in 1821, the Mexican government dissolved the mission system in 1834 and began granting the former mission lands to Mexican citizens and others for use as cattle ranches. Many of the grantees built adobe houses on their land grants, some of which survive today. The few towns and presidios founded by the Spanish, including San Francisco (presidio), San Jose (town), Los Angeles (town), and San Diego (presidio), continued to grow slowly. As a result of the Treaty of Guadalupe-Hidalgo, California became part of the United States in 1848. The subsequent gold rush of 1849 greatly increased the population of central California. The development of central California and the Bay Area increased substantially after the completion of the transcontinental railroad in 1869.

Southern California remained largely a cattle ranching area until the arrival of the Southern Pacific Railroad from San Francisco via the San Joaquin Valley in 1876, and from Yuma, Arizona, and points east in 1878. The number of immigrants to southern California dramatically increased in the late 1880s because of cheap railroad fares that resulted from a rate war between the Southern Pacific Railroad and the Atchison, Topeka, and Santa Fe (AT&SF) Railroad. The AT&SF Railroad arrived in southern California in 1886 and extended to Richmond in the Bay Area in 1900. One result of the immigration of large numbers of people to California in the 1880s was the development of new towns along the railroad routes and the construction of houses in the Victorian style in these towns and in the previously established urban centers, such as San Francisco and Los Angeles.

Continued urban expansion in conjunction with the first widespread use of automobiles resulted in construction of houses in the Craftsman bungalow style farther from the original urban cores during the 1910s and 1920s. The Spanish Colonial Revival style also became popular in the 1920s and continued into the 1930s. Use of automobiles led to linear commercial strips along arterials and shopping centers at major intersections. These buildings, as well as office buildings,

were often built in zigzag moderne (art deco) and streamline moderne styles in the 1930s and 1940s. Residences were built in ranch style with an open plan (combined living and dining rooms) beginning in the 1940s. In the 1950s, suburbs expanded with the advent of builders' tract homes, mostly in ranch style, where a limited number of plans were standardized and repeated throughout the tract.

Bay Area to Merced: By far the largest concentration of historic-era buildings, structures, and objects in this region is in urban centers such as San Jose, San Francisco, and Oakland. Resources of all the types appear in this portion of the Bay Area to Merced region. A certain number of historic architectural resources also appear in the town centers, and to a lesser extent, the rural countryside, of the Santa Clara and Central Valleys. Towns that were important local trade centers in the late 19th century, like Morgan Hill and Gilroy, exhibit concentrations of historical resources along the project corridors. Rural historical resources include infrastructure elements (such as water conveyance systems, bridges, industrial complexes and buildings, and rail stations), as well as farm and ranch complexes.

Diridon (Cahill) Station and Santa Clara Station in San Jose are historic and are part of National Register Historic Districts. Other historic districts in the region include the Redwood City Historic District along the Caltrain alignment, the Downtown Oakland Historic District, the Oakland Waterfront Warehouse District along the Oakland to San Jose via I-880 route, and the Alviso Historic District and Agnews Insane Asylum Historic District along the Oakland to San Jose via Milford route. There is also one historic district, the U.S. Naval Air Station Sunnyvale Historic District, in the San Francisco to San Jose segment, as well as two bridges listed in the NRHP, Carquinez Bridge and the Oakland–San Francisco Bay Bridge, on the Modal Alternative alignment.

Sacramento to Bakersfield: Buildings from the historic period along the alternative corridors in the Sacramento to Bakersfield region consist of residential and commercial structures located mostly in the towns and cities that developed along the Southern Pacific Railroad (now the Union Pacific Railroad [UPRR]) and Central Pacific Railroad routes in the 1870s.[6] Some of the region's railroad bridges and stations are also historic, along with some roads, highway bridges, and cemeteries. Construction of agricultural irrigation projects in the San Joaquin Valley began in the late 19th century and continued into the 20th century. There are many canal and levee systems in this region, some of which may be historic.

Because the UPRR tracks were initially constructed in the Central Valley in the mid- to late 19th century, the towns along the HST alignments that use the UPRR corridor have a high potential to contain 19th-century buildings. For example, one of the towns that developed during the 19th century along the UPRR corridor between Sacramento and Stockton is Elk Grove, a part of which is now a National Register Historic District. Alignments that use the Burlington Northern Santa Fe (BNSF) corridors established in the early 20th century avoid many of the smaller towns and pass through far fewer historically sensitive areas.

Bakersfield to Los Angeles: Historic structures along the project corridors in the Bakersfield to Los Angeles region are primarily 20th-century residential, commercial, and industrial structures located within cities. Large tracts of residential houses are most common, with industrial and commercial structures largely confined to existing railroad rights-of-way and station areas in Los Angeles.

Structures dating to before 1900 are rare. In many parts of the region, such as the Antelope Valley, structures from this time period were sparse and were built in perishable vernacular styles

[6] The Central Pacific was later purchased by the AT&SF Railroad (now the BNSF Railroad).

(e.g., wooden barns and other structures). In the largest cities of the region, Los Angeles and Bakersfield, large sections of houses and commercial structures built originally before 1900 have been replaced by subsequent development.

Los Angeles to San Diego via Inland Empire: Before 1900, the region's small towns had developed small-scale residential neighborhoods surrounding their central blocks. In the region's rural areas, the pre-1900 built environment consisted mostly of farm/ranch homes and related outbuildings, small bridges, dirt roads, and railroads and railroad-related terminals and warehouses. The small towns consisted mostly of residential and commercial buildings and offered better-established roads. Railroad stations in these smaller towns often served as the commercial hub for the surrounding areas.

By 1900, Los Angeles, Riverside, San Diego, and the central blocks of the smaller outlying towns had developed commercial/industrial buildings and were surrounded by more residential land uses.

Between 1900 and 1929, the built environment changed markedly, with the advent of the automobile age. Not only did the region experience population growth, but major improved road networks were also constructed to accommodate increased numbers of automobiles and trucks. During this timeframe, new types of specialized structures appeared in the built environment, including gas stations, parking garages, and auto/truck sales and repair/maintenance facilities. Urbanized areas continued to grow, and use of streetcars and interurban passenger rail services peaked at this time. In the years following World War I, Southern California experienced growth in military bases and training facilities. Important industrial facilities expanded in the Riverside and San Bernardino vicinities with Kaiser steelworks in Fontana being a notable example.

Very few pre-1900 structures remain near the proposed project alignments. A notable exception is the San Gabriel Mission (founded in 1771), located immediately adjacent to the former Southern Pacific Railroad (now UPRR) route through San Gabriel. There is the potential for a few pre-1900 buildings, including rail stations, along this railroad route in Pomona, Ontario, Guasti, San Bernardino, and Temecula. Los Angeles Union Station (LAUS) passenger terminal is listed in the NRHP.

Los Angeles to San Diego via Orange County: Historic structures in the LOSSAN region are primarily 20th-century (1900 to 1929 and 1930 to 1958) residential, commercial, and industrial structures located within cities. Large tracts of residential houses are most common, with industrial and commercial structures largely confined to existing railroad rights-of-way in the Los Angeles and San Diego areas. However, many of the medium-sized cities of the region, such as Anaheim, Fullerton, and San Clemente, began as small towns in the late 19th or early 20th century. The historic core areas of cities in this region commonly preserve some buildings from this time period.

Structures dating to the period before 1900 are rare. As in other parts of southern California, structures from this time period were sparse in much of this region and were built in perishable vernacular (wood frame) styles. However, there are notable exceptions, especially the Spanish and Mexican Period development in downtown San Juan Capistrano (1769 to 1848) around Mission San Juan Capistrano (founded in 1776) and the Hispanic to American Transition Period (1848 to 1870) development along the waterfront of San Diego, and Old Town San Diego. In the largest cities of the region, Los Angeles and San Diego, large sections of houses and commercial structures built before 1900 have been replaced by subsequent development.

Paleontological Resources By Region

California's rich geologic record and complex geologic history has resulted in exposure of many rock units with high paleontologic sensitivity at the surface. The fossil record in California is exceptionally prolific; abundant fossils representing a diverse range of organisms have been recovered from rocks as old as 1 billion years to as recent as 11,000 years. These fossils have provided key data for charting the course of the evolution and extinction of various types of life on the planet, both locally and globally, as well as for determining paleoenvironmental conditions, sequences and timing of sedimentary deposition, and other details of geologic history.

The following paragraphs summarize key paleontological resources by region. More detailed information is given in the regional technical reports on cultural and paleontological resources.

Bay Area to Merced: The major fossil-bearing units in the Bay Area to Merced region include the Irvington Gravels, Livermore Gravels, Merced Formation, Santa Clara Formation, Tulare Formation, Tehama Formation, Pinole Tuff, San Pablo Formation, Orinda Formation and Siesta Formation (Contra Costa Group), Briones Formation (San Pablo Group), Markley Sandstone, Nortonville Shale, Martinez Formation, Panoche Formation, Quinto Formation, Chico Formation, and Franciscan Formation. Pleistocene alluvial units also contain important paleontological resources.

Of the 237 vertebrate fossil localities identified within the study area, 93 (nearly 40%) are in materials of Pleistocene age, including the Los Banos alluvium, Riverbank Formation, Irvington Gravels, and Tulare Formation. Other units with a high sensitivity include the Pinole Tuff, the Contra Costa Group, and the San Pablo Group, all of which are of Miocene age. The Pleistocene and Miocene age geologic units are units with a high potential for containing vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.

Sacramento to Bakersfield: The most important paleontological resources in the Sacramento to Bakersfield region are contained in the Modesto-Riverbank Formations, the Turlock Lake-Laguna Formations, and the Franciscan Formation.

The Modesto-Riverbank Formations are largely unconsolidated Middle to Late Pleistocene units composed of interbedded poorly sorted brownish sandstone and siltstone with lesser amounts of pebble to cobble conglomerate. They are primarily fluvial (stream) deposits, and have yielded a wide range of fossils including clams, fish, turtles, frogs, snakes, birds, bison, mammoths, mastodons, ground sloths, camels, horses, deer, dire wolves, coyotes, rabbits, rodents, and land plant remains, including wood, leaves, and seeds.

The Turlock Lake-Laguna Formations are Pliocene in age and are composed of interbedded poorly sorted, reddish-brown siltstone and sandstone with lenses of pebble to cobble conglomerate. They are primarily fluvial deposits, but lacustrine (lake) beds are not uncommon. The Turlock Lake-Laguna Formations have yielded fossil remains at many sites, including petrified wood and the bones and teeth of a diversity of extinct land mammals.

The Franciscan Formation ranges in age from Jurassic through Cretaceous. The formation consists mainly of sandstone and shale or mudstone, but contains lesser amounts of chert, serpentinite, and greenstone. Coherent sedimentary units in the Franciscan primarily record deep marine deposition. Fossil vertebrates are rare; molluscan fossils and freshwater gastropods and pelecypods have been reported.

The Modesto-Riverbank and Turlock Lake-Laguna Formations occur in all segments of the Modal Alternative alignment except between Sacramento and Stockton. Along the HST Alternative route, they occur between Sacramento and Stockton in the Central California Traction (CCT)

alignments and in all the alignments between Modesto and Merced. The Franciscan Formation occurs only on the Modal Alternative route between Merced and Fresno.

Bakersfield to Los Angeles: Sixteen different formations occur along both the Modal and HST Alternative corridors in this region. In the Bakersfield to Los Angeles region, the following formations have the potential to yield fossils.

- The Tecuya Formation along I-5 from SR-99 to SR-14 and the I-5 Tehachapi crossing, with oreodont artiodactyl and amphicyonid carnivore fossils.
- The Tick Canyon Formation along the SR-14 corridor, with horse, camel, carnivore, and oreodont artiodactyl fossils.
- The Kinnock Formation along the SR-58 corridor, with canid fossils.
- The Monterey Formation along I-405 between LAUS and Burbank, with fish and marine mammal fossils.
- The Towsley Formation along I-405 to Burbank, and along I-5 from SR-99 to SR-14 and in the Soledad Canyon and Tehachapi crossing, with whale fossils.
- The Castaic Formation along SR-14 and I-5 in Soledad Canyon and the Tehachapi crossing, with fish, mollusk, sea cow, sea turtle, and tapir fossils.
- The Mint Canyon Formation along SR-14 and in Soledad Canyon, with horse, camel, peccary, and rodent fossils.
- The Peace Valley Formation along I-5 between SR-99 and SR-14 and in the Tehachapi crossing, with cypriniodont, plant, and killifish fossils.
- The Ridge Route Formation along I-5 from SR-99 to SR-14 and in the Tehachapi crossing, with rhinoceros, horse, ground sloth, mollusk, lizard, snake, gopher, bony fish, and plant fossils.
- The Horned Toad Formation along SR-58, with gomphothere fossils.
- The Walker Formation along SR-58, with shark, ray, bony fish, whale, and marine bird fossils.
- The Pico Formation along SR-14 and I-5 and in Soledad Canyon, with shark, whale, and clam fossils.
- The Harold Formation along SR-14 and in the Antelope Valley area, with mammals and birds fossils.
- The Saugus Formation along SR-14 and I-5 between SR-99 and SR-14, and in Soledad Canyon and the Tehachapi crossing, with camel, horse, tapir, deer, lizard, gopher, canid, shark, ray, and bony fish fossil.
- The Kern River Formation along SR-58, with mustelid carnivore, peccary, mouse, and vulture fossils.
- Older Quaternary alluvium along I-405 to Burbank; along SR-14, SR-58, and I-5 between SR-99 and SR-14; and in Soledad Canyon, Antelope Valley, and the Tehachapi crossing, with large mammal and small nonmammalian vertebrate fossils.

Los Angeles to San Diego via Inland Empire: The following formations that occur along proposed alignments of the Modal and HST Alternatives in the Los Angeles to San Diego via Inland Empire region have the potential to yield fossils.

- The Silverado Formation from March Air Reserve Base (ARB) to Mira Mesa, with mollusk fossils.
- The Ardath Shale from Mira Mesa to downtown San Diego, with shark, ray, bony fish, and marine microorganism and macroinvertebrate fossils.
- The Scripps Formation from Mira Mesa to downtown San Diego, with shark, ray, bony fish, marine invertebrate, rhinoceros, artiodactyl, brontothere, uintathere, crocodile, turtle, as well as wood fossils.
- The Friars Formation between Escondido and San Diego, with artiodactyl, perissodactyl, primate, opossum, insectivore, and rodent fossils.
- The Stadium Conglomerate Formation from Mira Mesa to San Diego and Mira Mesa to Qualcomm Stadium, with artiodactyl, perissodactyl, primate, opossum, insectivore, rodent, carnivore, and rhinoceros fossils.
- The Mission Valley Formation between Mira Mesa and San Diego, with shark, ray, bony fish, marine microorganism and macroinvertebrate, artiodactyl, perissodactyl, primate, opossum, insectivore, and rodent fossils.
- The Puente Formation from Los Angeles to March ARB and Mira Mesa, and from LAUS to Pomona via El Monte and South El Monte, with marine and terrestrial vertebrate, invertebrate, and plant fossils.
- The Sespe Formation from March ARB to Mira Mesa, with camel, rhinoceros, oreodont, carnivore, insectivore, primate, and rodent fossils.
- The Vaqueros Formation from March ARB to Mira Mesa, with shark, ray, crab, and clam fossils.
- The Fernando Formation from Los Angeles to March ARB and from LAUS to Pomona via El Monte, with shark, ray, bony fish, bivalve, snail, whale, bird, camel, and tapir fossils.
- An unnamed sandstone unit from March ARB to Escondido, with large mammal, small vertebrate and invertebrate, and giant teratorn fossils.
- The Lindavista Formation from Mira Mesa to San Diego and Escondido to Mira Mesa and Qualcomm Stadium, with shark, whale, and marine invertebrate fossils.
- The Pauba Formation from March ARB to Mira Mesa, with large and small vertebrate fossils.
- The Bay Point Formation from Mira Mesa to San Diego, with shark, ray, bony fish, and mollusk fossils.
- Quaternary terrace deposits from Mira Mesa to the Transit Center, with small and large mammal and bird fossils.
- Older Quaternary alluvium from March ARB to San Diego, with large mammal and plant fossils.

Los Angeles to San Diego via Orange County: The following formations in the LOSSAN region have the potential to yield fossils.

- The Ardath Shale and Scripps Formation along SR-52 to San Diego, with shark, ray, bony fish, marine microorganism and macroinvertebrate, rhinoceros, artiodactyl, brontothere, uintathere, crocodile, turtle, as well as wood fossils.
- The Delmar Formation in Del Mar and along I-5/I-805 at the SR-52 split, with estuarine vertebrate and invertebrate, aquatic reptile, and rhinoceros fossils.

- The Torrey Sandstone from Encinitas to Solana Beach and Del Mar, with plant and marine invertebrate fossils.
- The San Mateo Formation at Camp Pendleton, with horse, camel, peccary, llama, sea cow, fur seal, walrus, sea otter, sea bird, whale, dolphin, shark, ray, bony fish, and marine invertebrate fossils.
- The Capistrano Formation from Irvine to San Juan Capistrano, Dana Point, San Clemente, Camp Pendleton, Oceanside, and Carlsbad, with whale, walrus, sea cow, fur seal, sea bird, shark, ray, bony fish, and kelp fossils.
- The Niguel Formation from Irvine to San Juan Capistrano, with marine mollusk and marine vertebrate fossils.
- The San Diego Formation along SR-52 to San Diego, with shark, ray, bony fish, marine invertebrate, sea bird, walrus, fur seal, cow, whale, dolphin, terrestrial mammal, wood, and leaf fossils.
- The Lindavista Formation along I-5/I-805, with marine invertebrate, shark, and whale fossils.
- The Bay Point Formation along SR-52 to San Diego, with shark, ray, bony fish, and mollusk fossils.
- Unnamed marine terrace deposits from Camp Pendleton through Encinitas and Solana Beach to the Santa Fe Depot in San Diego, with marine invertebrate, shark, ray, bony fish, and terrestrial mammal fossils.

3.12.3 Environmental Consequences

A. EXISTING CONDITIONS COMPARED TO NO PROJECT ALTERNATIVE

The No Project Alternative is composed of transportation projects other than the proposed HST system that are projected to be completed between the time of this Program EIR/EIS and 2020, including local, state, and interstate transportation system improvements designated in existing plans and programs. No additional impacts on cultural resources would occur under No Project beyond those addressed in environmental documents for those projects.

Because it was not realistically feasible for this Program EIR/EIS to identify or quantify all the statewide impacts on or mitigation activities for cultural resources associated with all of the projects considered as part of the No Project Alternative, it is assumed that the existing condition is representative of No Project conditions. It is possible that other transportation projects (not including the Modal or HST Alternatives) may impact some existing cultural resources by 2020, and that these changes to the baseline would be described and quantified in subsequent environmental analysis and reflected in future database information. This Program EIR/EIS addresses the potential effect on cultural resources as they exist at present and uses this information to compare the potential for impacts from the alternatives evaluated.

B. NO PROJECT ALTERNATIVE COMPARED TO MODAL AND HIGH-SPEED TRAIN ALTERNATIVES

The ratings applied to the APE for highway improvement corridors and around airports under the Modal Alternative reflect the average number of archaeological and historical resources in the APE, based on existing records searches, that would be subject to potential impacts (adverse effects that may be significant) and require mitigation. The Modal Alternative would potentially impact archaeological resources and historic structures as a result of construction (short-term impacts) associated with expanding freeway rights-of-way to add lanes and as a result of airport expansion (new runways). Systemwide, the Modal Alternative is ranked as medium in terms of its potential impact on archaeological resources and historic structures. Cumulative impacts are likely because

the combined impacts from the Modal Alternative, No Project, and other community residential and commercial development projects would be greater than from the Modal Alternative alone. The Modal Alternative is ranked as high in terms of its potential impact on paleontological resources from expansion of highways and airports. This ranking is a result of the estimated 2,970 lane mi (4,780 km) of expansion statewide and the number of formations identified as sensitive for paleontological resources that would be crossed by highways.

The HST Alternative would potentially impact archaeological resources and historic structures as a result of construction (short-term impacts), including grading, cutting, tunneling, and erecting pylons for elevated track, as well as station construction. Systemwide, the HST Alternative is ranked as medium to high in terms of its potential impact on archaeological resources, historic structures, and paleontological resources. The HST Alternative's potential impact on historic structures is evaluated as generally higher on a systemwide basis compared to No Project or the Modal Alternative because the HST Alternative would use existing rail corridors in many of the regions. These existing rail corridors were developed during historic periods and the corridors tend to be surrounded by historic structures. Cumulative impacts are likely because the combined impacts from the HST Alternative, projects anticipated or planned for under No Project, and other residential and commercial development projects in the study area can be expected to be greater than from the HST Alternative alone. Potential impacts on historic properties during operation of the HST Alternative would be related to noise or visual impacts, discussed in Sections 3.4 and 3.9, respectively, of this Program EIR/EIS.

The Modal and HST Alternatives would have greater potential impacts on cultural resources than No Project. Although many of the potential impacts could be avoided or minimized through design refinements or alignment changes in a linear facility such as a highway or rail corridor, it is not always feasible to avoid impacts on cultural resources, and mitigation measures would need to be identified and evaluated to address these situations for specific projects.

Table 3.12-1 summarizes the comparison of potential impacts on cultural and paleontological resources for each of the alternatives. The table depicts relative ratings for potential impacts on cultural resources from each of the alternatives without evaluating the potential significance of adverse effects at this programmatic level of review. This information is based on available data and CHRIS records information, not on field studies.

Table 3.12-1
Summary Rating Table—Potential Impacts on Cultural and Paleontological Resources

	Archaeological Resources	Historic Structures	Paleontological Resources
Bay Area to Merced			
No Project	Medium	Medium	Low
Modal	Medium	Medium	High
HST	Medium	High	Medium
Sacramento to Bakersfield			
No Project	Low	Low	Low
Modal	Medium	Medium	High
HST	Medium	High	Medium

	Archaeological Resources	Historic Structures	Paleontological Resources
Bakersfield to Los Angeles			
No Project	Low	Low	Low
Modal	Medium	Medium	High
HST	High	High	Medium
Los Angeles to San Diego via Inland Empire			
No Project	Low	Low	Low
Modal	Medium	Medium	High
HST	Medium	Medium	High
Los Angeles to San Diego via Orange County			
No Project	Low	Low	Low
Modal	Medium	Medium	High
HST	High	High	High

3.12.4 Comparison of Alternatives by Region

This section describes differences in potential cultural resource impacts between alignment options in each of the five regions, based on available information (not on field studies). At this level of analysis, the extent and types of impacts on actual structures and sites are not known, nor is it known whether any such impacts would meet criteria for significance under NEPA/NHPA and CEQA. To compare impacts of alternatives at this program level, estimated numbers of potentially historic structures are being used to provide a relative sense of possible impacts.

A. BAY AREA TO MERCED

Modal Alternative

The total number of archaeological sites potentially impacted by the Modal Alternative in this region is 47. The northern portion of the Modal Alternative route from San Francisco/Oakland to San Jose has a medium ranking for archaeological sensitivity, while the southern portion from San Jose to Merced is ranked as low.

Sixty percent of the areas along the Modal Alternative route in this region developed during the historic period. The greatest number of historic buildings potentially affected by the Modal Alternative is found between San Francisco/Oakland and San Jose, where 100% of this area was developed during the historic period.

The Modal Alternative has the potential to affect an estimated 81 to 93 mi (130 to 150 km) of highly sensitive geologic units within the study area.

High-Speed Train Alternative

The total number of archaeological sites for the HST Alternative ranges from 16 (for the Oakland to San Jose via Hayward Line and the Diablo Range Direct corridors) to 35 (for the San Francisco to San Jose and Diablo Range Direct corridors). For archaeological resources, the No Project, Modal, and HST Alternatives are all ranked as medium, although the HST Alternative has a somewhat greater potential for impacts (see Table 3.12-1 above).

For the HST Alternative, 100% of both the Oakland to San Jose study area and the San Francisco to San Jose study area developed during the historic period. For historic structures, the No Project and Modal Alternatives have a medium ranking, while the HST Alternative is ranked medium to high. This could be reduced to medium if HST construction could be confined to the existing rail corridor and grade-separation impacts were minimized, particularly in the areas of the downtown Oakland Historic District, the Oakland Waterfront Warehouse District, the Redwood City Historic District, the Agnews Insane Asylum Historic District, the Santa Clara Station Historic District, and the Cahill (Diridon) Station Historic District in San Jose.

An estimated 28 mi (45 km) of geologic units identified as highly sensitive for paleontological resources have been identified for the HST Alternative.

High-Speed Train Alignment Options Comparison

All segments of the HST Alternative in this region, except the two Pacheco Pass alignment options, have a medium sensitivity for archaeological resources. The two Pacheco Pass options are ranked as low. For the San Jose to Merced portion of the study area, there is a slight difference between the Pacheco Pass routes (14%) and the Diablo Range direct routes (9%). The greatest numbers of archaeological sites occur along the two Diablo Range tunnel alignments (more than 20 each).

Both alignment options from San Jose to Merced via Pacheco Pass are ranked high for potential impacts on historic structures, whereas the alignment options using the three Diablo Range direct alignments area ranked low. Selection of the Diablo Range direct options would reduce potential impacts on historic structures.

For the HST alignment options, the key differences for paleontological resources are between the Pacheco Pass options, which would cross about 11 mi (18 km) of high-sensitivity rock units and 13 mi (21 km) of moderate-sensitivity units, compared to the Diablo Range Direct options, which would cross about 2 mi (3 km) of high-sensitivity rock units and 14 mi (23 km) of moderate-sensitivity units.

B. SACRAMENTO TO BAKERSFIELD

Modal Alternative

There are 85 archaeological sites in the study area for the Modal Alternative (50 prehistoric sites and 31 historic sites). Most sites are in the Sacramento to Stockton corridor (27) and the Tulare to Bakersfield corridor (30). Under the Modal Alternative, most sites are along SR-99, with relatively few sites along I-5. The SR-99 alignment under the Modal Alternative has the highest potential to impact archaeological resources, while the I-5 corridor is ranked low, with the lowest number of sites. The overall ranking for the Modal Alternative is medium.

More than 50% of the length of the SR-99 Sacramento to Stockton, Modesto to Merced, and Merced to Madera segments was developed during the historic period. As a result, the Modal Alternative has a medium potential to impact historic structures.

The Modal Alternative has a high potential to impact paleontological resources.

High-Speed Train Alternative

The number of archaeological sites potentially affected by the HST Alternative varies greatly, ranging from 55 to 225, depending on which alignments are chosen. In general, the HST alignments that have fewer archaeological sites are those that bypass the urban cores to the extent possible and follow the BNSF corridor. The APEs for the UPRR alignments that go through

the urban cores have the most archaeological sites. For example, between Modesto and Merced, the alignments that follow the UPRR corridor and go to the Merced Downtown Station each have the potential to affect more than 100 sites. The alignments that follow the BNSF corridor to the Merced Municipal Airport each have the potential to affect only one site. The minimum and maximum number of sites for the other corridors are not as high or low; they range from 17 to 32 for Sacramento to Stockton, 18 to 19 for Stockton to Modesto, three to 14 for Merced to Fresno, and 12 to 40 for Tulare to Bakersfield. Overall, the HST has a medium potential to impact archaeological resources.

Though the degree to which the historic structures along the HST alignment options developed during historic periods varies greatly, the HST Alternative has a high potential to impact historic structures. The latter is largely due to the fact that, although there are lower-ranked alternatives for most of the alignments between stations, all routes pass through station locations in historic urban cores. Examples include historic structures in the area of the downtown Sacramento Valley Station, which is the oldest area of the city, and the segment from Sacramento to Stockton with five known historic sites, two preservation areas, and one State Historic Landmark. The percentage of the route length with the potential to contain historic structures ranges from 20% to 37%. In urban cores, however, the route percentages of historic structures would be nearly 100%. Thus, the UPRR alignments that traverse the urban cores potentially impact the greatest number of historic structures. For example, the area around the following stations are almost entirely of historic age: the Downtown Sacramento Valley Station, Stockton ACE Downtown Station, Modesto Downtown Station, Fresno Downtown Station, Hanford Station, and Truxtun Station in Bakersfield. The UPRR route would go through Elk Grove and Galt, two towns established in the mid-1800s.

The HST Alternative has a medium potential to impact paleontological resources.

High-Speed Train Alignment Options Comparison

The potential impact of the HST Alternative on archaeological resources varies greatly, depending on the alignments chosen. The segments between Modesto and Merced have a high potential to affect archaeological resources, with about two-thirds of the more than 150 recorded historical sites that lie along the corridor concentrated in two areas: along a portion of the UPRR Line between Keyes and Atwater, and at the former Castle Air Force Base. The potential for historic structures is somewhat greater along the UPRR route because of the towns dating to the 1870s. Similarly, from Fresno to Tulare, the UPRR corridor would have the greatest number of historic structures per mile, over the BNSF alignment options. In general, the alignments that would have fewer historic structures are those that follow the BNSF corridor and bypass urban cores.

C. BAKERSFIELD TO LOS ANGELES

Modal Alternative

There are 49 recorded archaeological sites in the study area for the Modal Alternative. Most sites are in the I-5 corridor between SR-99 and SR-14 (18 sites) and in the SR-14 corridor between Palmdale and I-5 (30 sites). There is a high potential for as-yet-unidentified buried sites from the historic period (which may also be of concern to Native Americans) in the Tejon area south of the Grapevine along I-5 between SR-99 and SR-14. In this area, the Sebastian (Tejon) Indian Reservation is California Historical Landmark #133 and the Rose Stage Station is California Historical Landmark #300. In addition, Fort Tejon State Historic Park and the Tejon Ranch headquarters are located in this area.

For the Modal Alternative, the route following I-5 between Bakersfield and Santa Clarita has a medium potential to impact archaeological sites, while the route through the Antelope Valley

(SR-58/SR-14) has a low potential impact on archaeological sites. The remainder of the I-5 corridor from Santa Clarita to LAUS has a high potential for impacts on archaeological sites.

Half of the Modal Alternative segments are in areas that developed in the historic period, prior to 1958. These include I-5 from I-405 to Burbank, I-5 from Burbank to LAUS, and SR-58 and SR-14 between Bakersfield and Palmdale. The area around Burbank Airport was almost completely developed during the historic period. For historic structures, the Modal Alternative would have a low to medium ranking for this region.

The Modal Alternative would also impact paleontological resources because existing highways traverse 30 formations with high paleontologic sensitivity.

High-Speed Train Alternative

For the HST Alternative, there are two corridors under consideration between Bakersfield and Sylmar in the northern San Fernando Valley: the I-5 corridor and the SR-58–Antelope Valley–Soledad Canyon corridor. There are 17 recorded archaeological sites in the study area for the I-5 corridor using the Union Avenue corridor from Bakersfield to I-5 and 16 sites using the Wheeler Ridge corridor from Bakersfield to I-5. One prehistoric site reported to contain human burials is recorded within the Union Avenue study area. The Tehachapi Crossing portion of the I-5 corridor passes through the Tejon area discussed under the Modal Alternative.

The HST corridor that passes through the Antelope Valley has the potential to affect 68 recorded archaeological sites. The majority of the sites in the SR-58 corridor and the Soledad Canyon corridor are prehistoric. A burial was reported at one of the sites in the Soledad Canyon corridor. Most sites in the Antelope Valley corridor are historic trash scatters along the railroad.

The HST alignments between Sylmar and LAUS have no known archaeological sites because most of this area was not surveyed prior to development. The area developed prior to 1971 before systematic archaeological surveys began to be required. However, impacts are likely. There is a high potential for buried prehistoric sites in this area, especially along the Los Angeles River. There is also a high potential for buried historic sites in the vicinity of LAUS, located in the historic core of Los Angeles, because archaeological material from the 19th-century occupation of the area by Hispanic Americans, Chinese Americans, and Anglo Americans has been recovered.

More than 70% of the following HST Alternative alignments had developed by 1958: Burbank Airport to downtown Burbank, the Burbank Airport Station and Downtown Burbank Station, the Metrolink/UPRR route from downtown Burbank to LAUS, and the I-5 route from downtown Burbank to LAUS (cut and cover at Silverlake option). LAUS is listed in the NRHP.

High-Speed Train Alignment Options Comparison

The HST alignment from Bakersfield to Sylmar via the I-5/Grapevine has a low potential to impact archaeological sites, while the Antelope Valley alignment option has a high potential to impact archaeological sites, including recorded trash scatters from historic period along rail corridors.

For the HST Alternative, the alignment options from Bakersfield to Sylmar via the Grapevine have a medium to high potential for impacts on historic structures, whereas the Antelope Valley alignment option has a low to medium potential for such impacts.

Both alignment options leading into the LAUS have a high potential impact on historic structures because of the historic area surrounding the station.

The HST alignment options with the lowest potential impact on paleontological resources would be the I-5/Grapevine south of Bakersfield, using the Union Avenue corridor, and the Metrolink/I-5 aerial alignment option into LAUS. The I-5/Grapevine south of Bakersfield, using the Wheeler Ridge alignment and or the SR-58 and SR-14 corridors through the Antelope Valley with an at-grade cut would have greater potential impacts on paleontological resources.

D. LOS ANGELES TO SAN DIEGO VIA INLAND EMPIRE

Modal Alternative

The Modal Alternative has the potential to affect 85 recorded sites in this region; 44 of these are in the March ARB to Mira Mesa corridor. From March ARB to Mira Mesa, all alignments and corridors are ranked as having high potential impacts. From Mira Mesa to San Diego, the Modal Alternative is ranked as having medium potential impacts.

There are many commercial and residential structures from the periods 1900 to 1929 and 1930 to 1958 along the rail routes between Los Angeles and Ontario. There are relatively few structures from the historic period along the rest of the Modal Alternative alignment; only 16% of the study area developed during the historic period.

The mountainous terrain just south of Temecula is considered to contain important traditional tribal cultural areas.

High-Speed Train Alternative

The HST Alternative has the potential to affect between 125 and 136 recorded archaeological sites in this region, depending on the alignments used and excluding the spur from Mira Mesa to Qualcomm Stadium. For the corridor from LAUS to March ARB, there are between 18 and 25 recorded sites. For the corridor from March ARB to Mira Mesa, there are either 60 or 62 recorded sites, depending on which route through Escondido is used. From Mira Mesa to San Diego, there are 47 or 49 recorded sites, depending on which alignment between Mira Mesa and the Transit Center is used. There are five recorded sites in the corridor from Mira Mesa to Qualcomm Stadium.

The average percentage built historically for the HST alignments between LAUS and March ARB is 27.5%, with the highest being the UPRR Colton Line via San Bernardino (33%), and the lowest the UPRR Riverside Line–UPRR Colton Line (21%). The percentage built historically for the HST alignments between March ARB and Mira Mesa is 0.3% due to the rural characteristics of this area. For Mira Mesa to San Diego, the two alignments each average 21% of the study area built during the historic period. None of the spur from I-15 to Qualcomm Stadium developed during the historic period. Over 95% of the area around the San Diego Station at the Santa Fe Depot was developed during the historic period, and the station structure is listed in the NRHP.

The mountainous terrain just south of Temecula is considered to contain important traditional tribal cultural areas.

While the rankings for both the Modal and HST Alternatives for potential impacts on historic structures are similar, there is almost double the number of miles of HST alignment compared to the Modal Alternative.

For paleontological resources in this region, the two alternatives (Modal and HST) would have similar potential impacts on Pliocene-Pleistocene nonmarine sedimentary rock units and Quatenary Dune Sand.

High-Speed Train Alignment Options Comparison

The segment between March ARB and Mira Mesa has the highest potential to impact archaeological resources. The segment from LAUS to El Monte passes directly adjacent to San Gabriel Mission, where there are recorded archaeological sites dating to the late 18th and 19th centuries and high potential for encountering additional buried archaeological material from the historic period. The two HST alignment options (I-15 to Coast via Miramar Road and I-15 to Coast via Carroll Canyon) are ranked as having high potential impacts.

For this region, the UPRR Colton Line via San Bernardino would have the highest potential to impact historic properties.

E. LOS ANGELES TO SAN DIEGO VIA ORANGE COUNTY

Modal Alternative

The Modal Alternative would have potential impacts on 108 recorded archaeological sites in this region. However, all of the recorded sites are south of Irvine Station. This is due to lack of archaeological surveys north of Irvine Station prior to development of the area; as mentioned above, there were few systematic archaeological surveys until the passage of CEQA in 1971. More than 70% of the portion of the Modal Alternative between LAUS and Irvine and between SR-52 and Santa Fe Depot developed during the historic period, prior to 1958.

The Irvine to Oceanside segment of the Modal Alternative averages more than one recorded archaeological site per mile, indicating a high potential to yield previously unrecorded archaeological sites, particularly in the vicinity of San Juan Capistrano.

Therefore, the Modal Alternative between LAUS and Irvine has high potential to impact historic structures because most of the area developed during the historic period and significant historical resources remain.

High-Speed Train Alternative

For the HST alignments, there are three recorded archaeological sites between LAUS and Anaheim (UPRR corridor) and 21 sites between LAUS and Irvine following the LOSSAN (BNSF) corridor. The spur from LAUS to LAX has seven recorded sites. In the conventional rail alignments, there are 15 recorded sites between Fullerton Station and Irvine Station. For the three alignments through San Juan Capistrano, the open trench alignment along Trabuco Creek has two recorded sites, the tunnel under I-5 has eight, and the covered trench alignment near the existing rail alignment through the center of the city has 19 recorded sites. The town of San Juan Capistrano developed around the mission, which was situated next to a Native American village (Juaneño). Most of central San Juan Capistrano has archaeological material dating to the 19th century. Prehistoric material is also present. The Dana Point/San Clemente corridor has nine, 11, or 16 recorded sites, depending on which option is used. The short tunnel option has the fewest recorded sites, and the trench option has the most.

There are 41 sites recorded in the Camp Pendleton alignment, six in Oceanside/Carlsbad, four in Encinitas/Solana Beach, between two and 12 in Del Mar, depending on the option used (covered trench has the most; tunnel under Camino Del Mar has the fewest). In addition, I-5 to SR-52 has three or seven sites, and SR-52 to Santa Fe Depot has 12 recorded sites.

For the entire rail route between LAUS and San Diego, there are 97 recorded sites using the alignments and options with the lowest number of recorded sites, and 138 recorded sites using the alignments and options with greatest number of recorded sites. The HST alignment option from LAUS to Anaheim via the UPRR ranks low for recorded archaeological sites.

For the HST alignments, 52% of the area between LAUS and Anaheim (UPRR corridor) and 78% of the area between LAUS and Irvine following the LOSSAN (BNSF) corridor developed during the historic period. Fifty-eight percent of the area along the spur from LAUS to LAX developed historically. The HST Alternative between LAUS and Irvine has high potential to result in impacts on historic structures because much of the area developed during the historic period and examples of historic structures remain.

In the Modal Alternative's conventional rail alignments, more than 78% of the area between LAUS and Fullerton Station and more than 95% of the area between Fullerton Station and Irvine Station developed historically. The town of San Juan Capistrano developed around the mission, which is now listed in the NRHP. For the three alignments through San Juan Capistrano, both the open trench alignment along Trabuco Creek and the tunnel under I-5 are surrounded by areas of which 36% developed during the historic period. Forty-six percent of the area around the covered trench alignment near the existing rail alignment through the center of the city developed historically. This area includes the Los Rios Historic District. This alignment is the only one in this region where more than 10% of the adjacent area developed prior to 1900.

Thirty-eight percent of the area surrounding each of the three Dana Point/San Clemente corridor alignments developed during the historic period. In order of increasing density of historic development along the San Diego County alignments (expressed in percent developed prior to 1958), the Camp Pendleton alignment, I-5 to SR-52, Del Mar Solana Beach Station to I-5, SR-52 to Santa Fe Depot, Encinitas/Solana Beach, and Oceanside/Carlsbad range from 6% to 71%. The San Juan Capistrano Depot is located in the Los Rios Historic District and dates to 1894. Over 95% of the area around the San Diego Station at the Santa Fe Depot was developed during the historic period, and the structure is listed in the NRHP.

High-Speed Train Alignment Options Comparison

All of the rail alignments from Irvine to San Diego have a medium potential to impact historic structures. However, the HST Alternative would have higher impact potential because of the proximity to the Los Rios Historic District in San Juan Capistrano.

3.12.5 Mitigation Strategies

General mitigation strategies are discussed as part of this programmatic evaluation. Should the HST Alternative be carried forward, the Authority would consult with SHPO to define and describe general procedures to be applied in the future for fieldwork, methods of analysis, and potential specific mitigation measures for impacts on cultural and paleontological resources in the proposed HST Alternative corridors, which could be reflected in a programmatic agreement between the Authority and SHPO. Mitigation measures would be required for significant impacts on cultural resources that are listed or determined to be eligible for listing in the NRHP or CRHR.

A. ELIGIBLE OR LISTED ARCHAEOLOGICAL SITES

The following are potential mitigation measures for eligible or listed archaeological sites.

- Consider avoidance of impact.
- Incorporate the site into parks or open space (P.R.C. § 21083.2).
- Cap or cover the site before construction.
- Provide data recovery.
- Develop procedures for fieldwork, identification, evaluation, and determination of potential effects to cultural resources in consultation with SHPO and Native American tribes.

Avoidance is preferred, but if adjustments to the alignment plan or profile are not feasible, data recovery may be provided. Data recovery consists of archaeological excavation of an adequate sample of site contents so that the research questions applicable to the site can be addressed. Recovery of important information from the site mitigates the information loss that would result from site destruction. If only part of a site were impacted by the project, data recovery would only be necessary for that portion of the site. Data recovery would not be required if the agency determines prior testing and studies had adequately recovered the scientifically consequential information from the resources (CEQA Guidelines, 14 C.C.R. § 15126.4[b]).

B. LISTED OR ELIGIBLE HISTORIC STRUCTURES AND BUILDINGS

Mitigation measures for listed or eligible historic structures and buildings should include consideration of the following, where appropriate, in accordance with the Secretary of the Interior's standards for the treatment of historic properties and CEQA Guidelines.

- Repair.
- Stabilize.
- Rehabilitate.
- Restore.
- Relocate.
- Reconstruct.

Mitigation for impacts on a structure that would be demolished would include documentation following Historic American Building Survey or Historic American Engineering Record standards. This includes large-format photography and detailed architectural description. Under NHPA, this could adequately address adverse impacts. However, under CEQA guidelines, in some circumstances, documentation may not mitigate the effects to a level where there would be no significant effect resulting from demolition of eligible or listed structures (CEQA Guidelines, 14 C.C.R. § 15126.4[b][2]). Mitigation measures for alterations to the setting of historic structures and buildings typically consist of documentation of the setting prior to project construction and/or redesign of the project to make it more compatible with the original setting.

C. PALEONTOLOGICAL RESOURCES

Mitigation measures for paleontological resources would be developed and implemented at the project level. The following measures may be included.

- Educate workers.
- Recover fossils identified during the field reconnaissance.
- Monitor construction.
- Develop protocols for handling fossils discovered during construction, likely including temporary diversion of construction equipment so that the fossils could be recovered; identified; and prepared for dating, interpreting, and preserving at an established, permanent, accredited research facility.

Additional site-specific work would be required during project-level environmental review should a decision be made to proceed with the proposed HST system. At the conclusion of the programmatic environmental review process, the Authority and the FRA, in consultation with the SHPO, may develop a programmatic memorandum of agreement (MOA) to describe expectations for the next phase of

fieldwork, eligibility determination, and documentation under Section 106 of NHPA and pursuant to CEQA. The programmatic MOA may specify procedures for the identification and evaluation of impacts for future projects.

3.12.6 Subsequent Analysis

The following paragraphs describe the procedures that would be necessary at the next stage of environmental review to determine appropriate and feasible mitigation measures in consultation with the SHPO, if a decision is ultimately made to go forward with the proposed HST system. These procedures would also satisfy CEQA requirements. Under NHPA Section 106 and implementing regulations (36 C.F.R. Part 800), the procedures would include identifying resources with the potential to be affected; evaluating their significance under NRHP and CEQA; and identify any significant or substantially adverse impacts, and then evaluating potential mitigation.

Identifying potentially affected archaeological and historical resources would require field surveys of all unsurveyed areas within a more specifically defined study area that would include the area where direct and indirect impacts from construction could occur (including locations of easements and construction-related facilities, such as equipment staging areas, borrow and disposal areas, access roads, and utilities) and the area(s) where the settings of any eligible historic buildings and structures, or the buildings and structures themselves, could be materially or significantly altered.

All identified resources would then be evaluated using NRHP and CRHR eligibility criteria. Evaluating archaeological sites may require preparing test plans for archaeological resources that contain regionally relevant research questions. The Authority and the FRA would consult with the SHPO on any test plans and determinations of eligibility for evaluated resources. The impacts of a proposed specific project on resources determined eligible would be analyzed. An impact analysis report may then be reviewed with the SHPO.

Mitigation measures needed to address impacts on specific resources could then be developed and incorporated in an MOA between the SHPO, the Advisory Council on Historic Preservation, the FRA, and the Authority during the preparation of project-specific environmental evaluation. The mitigation measures in the MOA would then be incorporated into project-specific environmental documentation and project approvals.

A paleontological resource assessment program would also be completed as part of the subsequent analysis for a project-level EIR/EIS. The assessment program would include field reconnaissance to identify exposed paleontological resources and more precisely determine potential paleontologic sensitivity for the project. A paleontological resources treatment plan would be prepared by a qualified paleontologist. The plan would be included in project approval and would address the treatment of paleontological resources discovered prior to and during construction.

Further consultation would also occur at the project level with the Native American Heritage Commission as necessary, and with Native American groups when traditional territories may be close to APEs for the project. Additionally, more specific information related to traditional cultural sites of concern would be obtained as necessary.